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Application No.: 10/052,538

Docket No.: 520.35237/VX3

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. – 37. (Cancelled)

38. (Currently Amended) A plasma processing apparatus comprising:

a vacuum processing chamber,

a pair of plate electrodes opposite to each other, one of the electrodes being used also as a sample table capable of holding a sample having a diameter of 300 mm or more containing an insulator film,

a gas introducing means capable of introducing a fluorine-containing etching gas into the vacuum processing chamber, and

a plasma generating means for forming said introduced gas into a plasma, wherein: and

~~the sample has a diameter of 300 mm or more,~~

means for decreasing the amount of fluorine in the plasma to decrease the amount of fluorine near the sample, said decreasing means comprising an electrode cover comprising a material containing Si or C is disposed at on the other of the pair of plate electrodes to react with fluorine and setting a gap between said pair of plate electrodes to 30 mm to 60 mm.

wherein a pressure in the atmosphere between the pair of flat plate electrodes is set to 0.5 Pa to 4.0 Pa, and

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wherein a high frequency electric power of 30 MHz to 200 MHz is applied to between the other of the pair of plate electrodes, and
a gap between the plate electrodes is set to 8 mm to 50 mm.

39. (Currently Amended) A plasma processing apparatus according to claim 37 or 38, wherein the gas introducing means has a gas diffusion plate, and the electrode cover situated downstream of the gas diffusion plate has fine plural apertures.

40. – 41. (Cancelled)

42. (Previously Presented) A plasma processing apparatus according to claim 37 or 38, wherein a discharge confining ring and/or a susceptor cover containing Si or C is situated near the sample.

43. (Previously Presented) A plasma processing apparatus according to claim 42, wherein the insulator between the susceptor cover and the sample table has a thickness of 0.5 mm to 5 mm.

44. – 45. (Cancelled)

46. (New) A plasma processing apparatus according to claim 38 further comprising a bias electric power source connected to said one electrode used as a sample table for applying a bias voltage to said sample table.

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47. (New) A plasma etching apparatus comprising a vacuum processing chamber and a pair of electrodes opposite to each other that are disposed in said vacuum processing chamber, one of said electrodes being used also as a sample table capable of holding a sample having a diameter of 300 mm or more containing an insulator film,

wherein said plasma etching apparatus further comprises:

a gas introducing means for introducing an etching gas containing at least fluorine and carbon into said vacuum processing chamber;

a high-frequency power source to apply a high-frequency electric power of 30 MHz to 300 MHz between said pair of electrodes whose gap is set to 30 mm to 100 mm so as to generate a plasma with a density of $5 \times 10^{10} \text{ cm}^{-3}$ to $5 \times 10^{11} \text{ cm}^{-3}$ between said pair of electrodes; and

a bias electric power source connected to one of said electrodes to control energy of ions in said plasma.

48. (New) A plasma etching apparatus according to claim 47, further comprising means for setting an atmospheric pressure inside said vacuum processing chamber to 0.4 Pa to 4.0 Pa.

49. (New) A plasma etching apparatus according to claim 47, where said one of said electrodes is provided with an electrostatic attracting film, a heat transfer gas being supplied between said electrostatic attracting film and a back surface of said sample.

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50. (New) A plasma etching apparatus comprising a vacuum processing chamber and a pair of parallel plate electrodes opposite to each other that are disposed in said vacuum processing chamber, one of said electrodes being used also as a sample table capable of holding a sample,

wherein a plasma with a density of $5 \times 10^{10} \text{ cm}^{-3}$ to $5 \times 10^{11} \text{ cm}^{-3}$ is generated between said pair of electrodes, and a gap between said pair of electrodes is set to a distance capable of utilizing surface reaction between said pair of electrodes effectively.

51. (New) A plasma etching apparatus according to claim 50, wherein said gap is set to a distance capable of utilizing surface reaction between said pair of electrodes effectively to decrease the amount of fluorine in said plasma near said sample.